

# Care and conservation of botanical specimens

This leaflet provides information about the care of botanical collections and how to prevent, notice and manage problems that may arise. At the end of this leaflet you will find weblinks to useful suppliers and contacts if you are concerned about your collections. Museums and county or regional Museum Development Officers can also provide help and advice on all areas of collections care.

Botanical collections include:

- **Herbarium collections:** collections of dried, pressed specimens
- **Non-herbarium specimens:** lichens, bryophytes, liverworts, fungi
- **Spirit specimens:** whole plants, seeds, and fruit preserved in a fluid
- **Microscope slides:** seeds, diatoms, pollen, sections of plants, etc.

## Setting the right environment

Botanical collections need to be stored in the correct environment to reduce potential pests. Pests can be noticed by small piles of dust on the herbarium sheet and/or noticeable damage to the paper the specimen is mounted on.

Very dry environments can cause botanical collections to become brittle and break. This environment can also damage paper mounts for specimens.

A damp environment can lead to the growth of mildews and moulds, which are extremely destructive and can cause damage to both specimens and paper through their secretion of digestive enzymes.

## Care of Collections

### The Store Room

All collections should be stored in secure, environmentally controlled store rooms. To minimise any deterioration of specimens store them in stable environmental conditions, keep them out of direct sunlight and limit other light sources. Store rooms should be kept at a relative humidity (RH) level of between 45% and 55%, which may need a dehumidifier or humidifier. Temperature levels should be kept between 18°C and 22°C.

Store rooms are never completely immune to pests. Most pests will lay eggs inside specimens and the young stage (the larvae) will cause the most damage. Pests can be reduced by the regular vacuuming of storage areas and not allowing any food or drink in the store rooms.

Pests can be monitored using insect traps (such as the sticky trap). Quarterly checks of the insect traps will show the types of pests (if any) entering your store room. It is advisable to physically inspect your collections twice a year for any pest activity.

### Storage

Herbarium specimens should be mounted onto sheets of archival quality paper. Sheets holding the same species are best stored in lightweight one-fold archival card covers, called 'species folders'. The different species of the same genus are stored together in 'genus folders'; made from thin archival quality card and scored with a spine, they should close slightly larger than the species folders to protect the edges.

Bryophytes (mosses), fungal collections and lichens are often stored in cotton packets, envelopes or boxes. The original label should be kept with the specimen and stored in a polyester envelope (Melinex® or Mylar®).

If storing herbarium collections in boxes, an archival box with a drop-down front is recommended. Metal cabinets do not release volatile organic compounds (VOCs), like wooden cabinets do. The metal shelves can be easily cleaned and a well-sealed cabinet will provide a stable micro-climate for the specimens.



Combined mould and insect pest damage to a 19th century herbarium specimen

## Find a conservator by using the conservation register

The Register is free to use; it provides detailed information on conservation-restoration practices based in the UK and Ireland including contact details, referenced examples of previous work and the qualifications of members of staff. It is searchable by specialist skill and geographical location and each business has been required to meet rigorous criteria which include professional accreditation of the lead conservator of the business; the information is regularly updated..

[www.conservationregister.com](http://www.conservationregister.com)



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## Safe Handling

Herbarium sheets are very fragile. To minimise any risk the folder should be completely removed from the cabinet and placed on a flat surface. Open the folder flat out and always keep it horizontal. The herbarium sheets should always be held with both hands at the sides of the sheet, and never turn the sheets as though they were the pages of a book. Leaning on herbarium sheets, writing notes on top of them or placing heavy items or elbows on them can cause serious damage.

Older herbaria specimens may have been treated with toxic chemicals, including lead, mercury and arsenic, to prevent pests. When working with specimens prepared earlier than 1989, wear nitrile gloves in a well ventilated room. The card on which the specimen is mounted and the specimen itself may contain the chemicals. The dust on herbaria sheets may be contaminated, so if cleaning the sheets use a dust extractor/fume cupboard and wear a dust mask.

## Dealing with Pests

Pests can be treated by one of the following methods;

- **Freezing:** place the specimen inside a clear polyester bag, push out excess air, and heat seal, or place inside polythene bags and use parcel tape to seal. This should be placed into a normal domestic freezer for at least 14 days at a temperature of  $-18^{\circ}\text{C}$ , or for 72 hours if freezing at  $-30^{\circ}\text{C}$ .
- **Anoxia:** this method starves the pests of oxygen. Small anoxic environments are created using sealed barrier films (such as Marvelseal™ or Escal™ or re-usable aluminium laminate) and placing oxygen scavengers and RH buffers inside before sealing.

## Basic Remedial Conservation

Any treatment carried out should be fully documented to provide a record for future conservation and/or research of the specimen. If you are unsure about the treatment of a specimen, contact a conservator or curator for advice.

- **Dust and dirt:** dirt can be removed from the herbarium sheets by using a smoke sponge. Gently rub the place where the dirt is and then softly remove any excess with a fine brush. Do not use the smoke sponge on pencil labels, as it will rub out the pencil. Be careful when rubbing on the sheet close to the specimen. Always wear gloves and a dust mask.
- **Broken/unattached specimens:** plant specimens can be reattached to the herbaria sheet using thinly cut strips of archival, pre-gummed linen tape. Detached material such as seeds, leaves, etc., can be placed in an acid-free card fragment packet, which is secured onto the specimen sheet with the original specimen.
- **Spirit Collections:** check the fluid levels in jars and check that the fluids are not discoloured or contaminated. Fluid levels should be checked annually and advice should be sought about topping up. Fragile or loose labels can be archived in polyester envelopes and the data recorded onto new labels, using pigment ink, to be stored inside the jar. If your venue is not equipped to work on serious conservation problems for spirit collections, please contact a conservator or curator for advice.
- **Microscope slides:** specimens can be mounted in short-term mounting media which can rapidly deteriorate by contracting, darkening or crystallising and thus destroying the specimens. Slides should be checked annually, and if serious deterioration is noticed, a microscope slide conservator should be contacted. Slides can be cleaned of surface dirt using wool swabs or buds dampened with deionised water.

Many of these problems happen because of poor storage conditions. Basic remedial conservation can be carried out on affected specimens, but the storage will need to be reviewed. Placing specimens back in the same storage will cause the same problems to reoccur.

## Seeking further help

Botanical collections include a wide range of different specimens, which can have a variety of problems. If you notice something which you are unsure about, please contact a specialist conservator or curator for advice. If you are unsure or unable to locate help locally, please contact the Institute of Conservation or the Natural Sciences Collections Association.

Other natural history leaflets in this series:

Care and conservation of geological specimens

Care and conservation of zoological specimens

### Useful weblinks:

The Institute of Conservation: [www.icon.org.uk](http://www.icon.org.uk)

The Natural Sciences Collections Association: [www.natsca.info](http://www.natsca.info)

The Conservator Register: [www.conservationregister.com](http://www.conservationregister.com)

### Suppliers:

Constrain: [www.historyonics.com](http://www.historyonics.com)

Escal™: [www.csconserv.co.uk](http://www.csconserv.co.uk)

Conservation packaging and materials can be purchased from:

Conservation by Design [www.conservation-by-design.co.uk](http://www.conservation-by-design.co.uk)

Conservation Resources Ltd: [www.conservation-resources.co.uk](http://www.conservation-resources.co.uk)

Preservation Equipment: [www.preservationequipment.com](http://www.preservationequipment.com)

This leaflet has been produced in partnership with the Institute of Conservation (Icon) and the Natural Sciences Collections Association (NatSCA).

## Icon, the Institute of Conservation

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about*

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[www.icon.org.uk](http://www.icon.org.uk)



NatSCA is a charity registered in England & Wales (No. 1098156). NatSCA represents natural science collections and the staff that work with them. Its aims include advancing best practice within the sector, providing training, acting as an advocate and working with relevant governing bodies.

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